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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,776	12/30/2003	Valery M. Dubin	42P17745	1065
8791	7590	01/27/2006	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			ABRAMOWITZ, HOWARD E	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/749,776	DUBIN ET AL.
Examiner	Howard E. Abramowitz	Art Unit 1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 30 December 2003.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1-30 is/are pending in the application.  
4a) Of the above claim(s) 10-30 is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-9 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) 1-30 are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 30 December 2003 is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/30/03.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_ .

**DETAILED ACTION**

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9, drawn to a method, classified in class 427, subclass 437.
- II. Claims 10-18 and 28-30 drawn to a product, classified in class 428, subclass 457.
- III. Claims 19-24, drawn to an apparatus, classified in class 106, subclass 1.22.
- IV. Claims 25-27, drawn to a method, classified in class 106, subclass 1.22.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case The product could be made by a materially different method such as using a substrate that doesn't have a metal portion.

Inventions III and I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process

could be practiced by a materially different product such as one that uses a high molecular weight compound containing an element comprising at least Si N or C.

Inventions I and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention group I has separate utility such as forming the group VIII metal with the Si, N or C concurrently instead of adding the Si, N or C as claimed in group IV. See MPEP § 806.05(d).

Inventions III and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a solution for forming a metal oxide of the group VIII metal and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Inventions IV and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the

process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product could be formed by a materially different process such as the group VIII metal with the Si, N or C could be formed concurrently instead of adding the Si, N or C to the metal.

Inventions III and IV are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process as claimed could use a materially different product such as one that uses a high molecular weight compound containing an element comprising at least Si, N or C.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Michael Bernadicou on 1/17/06 a provisional election was made with traverse to prosecute the invention of group I, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-30 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Park (US Patent 6,962,873).

Referring to claim 1, Park discloses providing a substrate having a metal portion and forming a metal capping layer on the metal portion, the capping layer comprising Cobalt, a group VIII metal, and Nitrogen (abstract, figure 2, column 2 lines 37-53).

Referring to claim 2, as discussed above the group VIII metal is Cobalt.

Referring to claim 3, the capping layer can also contain Tungsten, which is a refractory metal (column 3 lines 21-30, column 6 lines 2-4).

Referring to claim 4, the Cobalt layer is formed by electroless deposition (column 2 lines 37-53, column 3 line 50).

Referring to claim 5, the thickness of the capping layer is 50-500 angstroms (column 4 line 27).

Referring to claim 6, the metal capping layer is formed on a copper interconnect line (abstract, column 1 lines 48-67).

Referring to claim 7, Park discloses providing a substrate having a metal portion, forming a metal capping layer on the metal portion comprising a group VIII metal, and incorporating Nitrogen by plasma enhanced chemical vapor deposition after forming the capping layer (column 2 lines 37-53, column 7 lines 1-19).

Referring to claim 9, Park discloses that the metal portion is copper (figures 2 and 3).

Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Qiao et al. (US Patent No. 6,803,318).

Referring to claims 1 and 2, Qiao et al. discloses forming a cobalt silicide layer over a conductive layer (column 13 lines 16-33).

Referring to claim 3, the cobalt silicide contains cobalt which is a refractory metal.

Referring to claims 7 and 8, Qiao et al. discloses a substrate having a metal portion and forming a metal capping layer on the metal portion the metal capping layer comprising cobalt silicide by CVD deposition of silane. Extra silicon is available for this layer from the plasma enhanced deposition of the top insulating layer formed by plasma enhanced chemical vapor deposition of silane (column 13 lines 16-55)

Referring to claim 9, the metal layer can be copper (column 13 lines 16-18).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard E. Abramowitz whose telephone number is 571-272-8557. The examiner can normally be reached on monday-friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*HEA*  
HEA

*Michael Cleveland*  
MICHAEL CLEVELAND  
PRIMARY EXAMINER